

Influence of impulsivity on the discount function

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Our everyday life is based on deciding between alternatives which have either immediate or deferred consequences. Results from earlier decision-making experiments show that people rather tend to choose secure over probable outcomes, exhibiting a risk-avoiding behaviour. Furthermore, rewards that are received sooner are more attractive than future rewards. In neuroeconomical terms, this is referred to as temporal discounting, and the change of a value as a function of its delay is described by a hyperbolic discount function.

Impulsive individuals devalue delayed rewards more strongly than their less-impulsive fellows, a behaviour which can also be observed in several psychiatric disorders such as attention deficit hyperactivity disorder or drug abuse.

Despite its value for understanding the fundamental principles of decision making for economics, advertising industry and applied social studies, the neural mechanisms of human judgement are still not sufficiently understood.

We developed a paradigm which assesses the influence of impulsive behaviour on temporal discounting in males by presenting appealing pictures of women prior to a reward decision task. We plan to use the 7 T scanner in order to depict brain regions which are active during reward under impulsive conditions and hope to profit from the high spatial resolution to reveal the differential encoding of immediate vs. delayed reward in different regions of the striatum. To our knowledge, studies which show an accurate discrimination of striatal activation during reward processing have not been published yet.

An additional goal of the experiment is to test the influence of impulsivity on the discount function.